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EXAMINER

DINH, PAUL

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 01/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/476,416

Applicant(s)

PYO ET AL.

Examiner

Paul Dinh

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 10, 12-22, 24, 25 and 27-30 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 11, 23 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Drawings

- a. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings are required.
- b. Figures 1-3 are objected to because they are not labeled "PRIOR ART" according to the brief description of the drawings.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) The invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-6, 9-10, 12-22, 24-25, 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Scepánovic et al. (USP 5661663).

Regarding claims 1-2, 15, 20, 22, 27, Scepánovic discloses in figures 2-10, a medium and a method of use comprising:

identifying partial feasible routing solutions (clusters) corresponding to each of a subset of wires to be routed;

merging (i.e., figs. 7a-c) the partial feasible routing solutions to identify one or more feasible routing solutions for the set of wires to be routed.

(Note that the limitations:

- a. *"a maze router" and "a deferred merging router" in claim 22 are merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation; and*
- b. *"that do not conflict" in claim 15 is merely the result of the recited limitation therefore, it cannot be relied upon to define over prior art that meets the claimed limitation)*

Regarding claims 3, 16, 21, 28-29, the identified partial feasible routing solutions and feasible routing solutions are sorted/resorted by a cost function (software 34 and cost factor computation of figure 2, note that the limitations *"first/second user/one or more user-selected/specified"* are merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation.

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Regarding claims 5 and 30, the number of partial feasible routing solutions and feasible routing solutions are limited to a first and a second numbers, respectively (by software 34 of figure 2, also see claims 30-31).

Regarding claim 6, the method of claim 5 wherein merging comprise:

merging partial feasible solution in a routing tree, wherein the number of partial feasible routing solutions at each node of the routing tree may be limited (by software 34 of figure 2 and figures 5-9, note that the limitation "*user-specified limitation*" is merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation)

Regarding claim 9, Scepanovic discloses in figures 2-10, a medium and a method of use comprising:

constructing multiple partial feasible routing trees (i.e., by the tree construction means 36 of figure 2 and diagrams 8a-c), each of the partial feasible routing trees identifying a set of partial feasible routing solutions for a subset of wires to be routed; and

merging (i.e., figs. 7a-c) the multiple partial feasible routing trees to identify a set of feasible routing solutions for the set of wires to be routed.

Regarding claim 10, constructing multiple partial feasible routing trees comprises determining partial feasible routing solutions (clusters) for each of the subset of wires to be routed until all partial feasible routing solutions have been identified (by software 34 of figure 2, note that the limitation "*user-specified limit...*" is merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation).

Regarding claims 12-14, 17-19, Scepanovic discloses:

(Claims 12-14) cost functions for partial feasible partial routing solutions, ordering/re-ordering, merging the partial feasible partial routing solutions (elements 34, 36, 38, and 42 of figure 2 and figs. 7a-c)

(Claims 17-19) limiting/reordering the number of possible routes of routing trees
cost functions for partial feasible partial routing solutions, ordering/re-ordering, merging the partial feasible partial routing solutions (elements 34, 36, 38, and 42 of figure 2 and figs. 5-9).

Regarding claims 24-25, the maze router and the deferred merging router are *merely* the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation.

Claims 1-6, 9-10, 12-22, 24-25, 27-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (USP 6260177).

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Regarding claims 1-2, 15, 20, 22, 27, Lee discloses in figure 7, a medium and a method of use comprising:

identifying partial feasible routing solutions (steps 701-702) corresponding to each of a subset of wires to be routed;

merging (step 703) the partial feasible routing solutions to identify one or more feasible routing solutions for the set of wires to be routed.

(Note that the claimed partial feasible routing solutions and feasible routing solutions are considered as the single poly structures and doubled poly structures because the single poly structures are a subsets of wires to be and the double poly structures are sets of wires to be routed)

Regarding claims 3, 16, 21, 28-29 the identified partial feasible routing solutions and feasible routing solutions are sorted/resorted by a cost function (see claims 7-8, 14-16).

Regarding claims 5 and 30, the number of partial feasible routing solutions and feasible routing solutions are limited to a first and a second numbers, respectively (by the computer system and instruction codes in Lee's invention).

Regarding claim 6, Lee discloses in figure 2, the method of claim 5 wherein merging comprise: merging partial feasible solutions in a routing tree, wherein the number of partial feasible routing solutions at each node of the routing tree may be limited (branch original netlist 201 and branch ECO netlist 204 form a tree, note that the limitations "user-specified limitation" is merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation)

Regarding claim 9, Lee discloses in figure 2, a medium and a method of use comprising: constructing multiple partial feasible routing trees (branch original netlist 201 and branch ECO netlist 204 form a tree), each of the partial feasible routing trees identifying a set of partial feasible routing solutions for a subset of wires to be routed; and

merging (compare block and steps 206-208) the multiple partial feasible routing trees to identify a set of feasible routing solutions for the set of wires to be routed.

Regarding claim 10, constructing multiple partial feasible routing trees comprises determining partial feasible routing solutions for each of the subset of wires to be routed until all partial feasible routing solutions have been identified (by the computer system and instruction codes in Lee's invention), note that the limitation "user-specified limit..." is merely the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation).

Regarding claims 12-14, 17-19, Lee discloses:

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cost functions for partial feasible partial routing solutions, ordering/re-ordering, merging the partial feasible partial routing solutions and limiting/reordering the number of possible routes of routing trees cost functions for partial feasible partial routing solutions, ordering/re-ordering, merging the partial feasible partial routing solutions (see claims 7-8, 14-16)

Regarding claims 24-25, the maze router and the deferred merging router are *merely* the intended use; therefore, they cannot be relied upon to define over prior art that meets the claimed limitation.

Allowable Subject Matter

Claims 7-8, 11, 23, 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-8, 11, 23, 26 would be allowable because the prior art does not teach or suggest the limitations in claims 7, 11, 23.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Dinh whose telephone number is (703) 305-5662. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (703) 308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Paul Dinh
Patent Examiner

December 31, 2001



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
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